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UNITED STATES GOVERNMENT SPECIFICATION FOR LIQUID PAINT DRIER.

FEDERAL SPECIFICATIONS BOARD.

STANDARD SPECIFICATION No. 20.

This specification was officially adopted by the Federal Specifications Board on February 3, 1922, for the use of the departments and independent establishments of the Government in the purchase of materials covered by it.

CONTENTS.

	Page.
1. General	1
2. Sampling	2
3. Laboratory examination	2
4. Basis of purchase	4

1. GENERAL.

This specification applies both to straight oil drier—that is, material free from resins or "gums"—and to Japan drier; that is, material containing varnish "gums."

The drier shall be composed of lead, manganese, or cobalt, or a mixture of any of these elements combined with a suitable fatty oil, with or without resins or "gums," and mineral spirits or turpentine, or a mixture of these solvents. It shall be free from sediment and suspended matter. The drier when flowed on metal and baked for 2 hours at 100° C. (212° F.) shall leave an elastic film. The flash point shall be not lower than 30° C. (85° F.) when tested in a closed-cup tester. It shall mix with pure raw linseed

oil in the proportion of 1 volume of drier to 19 volumes of oil without curdling, and the resulting mixture when flowed on glass shall dry in not more than 18 hours. When mixed with pure raw linseed oil in the proportion of 1 volume of drier to 8 volumes of oil, the resulting mixture shall be no darker than a solution of 6 g of potassium dichromate in 100 cc of pure sulphuric acid of specific gravity 1.84.

NOTE.—Deliveries will, in general, be sampled and tested by the following methods, but the purchaser reserves the right to use any additional available information to ascertain whether the material meets the specification.

2. SAMPLING.

It is mutually agreed by buyer and seller that a single package out of each lot of not more than 1,000 packages be taken as representative of the whole. Whenever possible, an original unopened container shall be sent to the laboratory, and when for any reason this is not done, the inspector shall thoroughly mix the contents of the container sampled, transfer not less than 1 quart to a clean, dry glass bottle or tin can which must be nearly filled with the sample, securely stoppered with a new clean cork or well-fitting cover or cap, sealed, and distinctly labeled by the inspector. The inspector should take a duplicate from the container sampled to be held for check in case of dispute, and, when requested, should take a sample for the seller.

3. LABORATORY EXAMINATION.

(*a*) SEDIMENT AND SUSPENDED MATTER.—Thoroughly mix the sample. Fill two test tubes of the same size (15 cm, or 6 inches) to within 2.5 cm (1 inch) of the top with the sample. Stopper the tubes with clean corks. Let stand for 24 hours. Note whether sediment is evident in the tubes; if not, shake one tube vigorously and compare the two tubes. If they still look alike, the sample is considered free from sediment and suspended matter.

(*b*) COLOR.—Mix 2 cc drier and 16 cc clear pure raw linseed oil that complies with the specifications of B. S. Circular No. 82. Dissolve 6 g of pure powdered potassium dichromate in 100 cc of pure concentrated sulphuric acid (specific gravity 1.84). Gentle heat may be used if necessary to secure a perfect solution of the dichromate. This solution should be freshly prepared. The color comparison shall be made by placing the 1:8 drier-linseed oil mixture and the dichromate-sulphuric acid solution in thin-walled glass tubes of the same diameter, 1.5 to 2 cm ($\frac{5}{8}$ to $\frac{13}{16}$ inch) to

depths of at least 2.5 cm (1 inch) and comparing the depth of color by looking through the tubes across the column of liquid by transmitted light.

(*c*) MIXING WITH LINSEED OIL, SETTING TO TOUCH, AND DRYING.—Mix 1 cc of the sample and 19 cc of clear pure raw linseed oil that complies with the specifications of B. S. Circular No. 82. Thoroughly clean a glass plate, finally washing with benzol and drying. Pour a portion of the mixture of linseed oil and drier over this plate and place the plate in a vertical position in a well-ventilated room, the atmosphere of which is free from products of combustion or laboratory fumes. Allow the remainder of the mixture to stand for 2 hours. No sediment or precipitate should appear. At 1-hour intervals examine the film of oil on the plate by touching it lightly with the finger at points not less than 2.5 cm (1 inch) from the edges. If the film still has the greasy feel of fresh linseed oil, it has not set to touch. If the film feels tacky and adheres to the finger, it is considered to have set to touch. If the finger can be drawn lightly across the film without the oil sticking to the finger or the surface being marred by this treatment, the oil is considered dry. In case the test shows time of setting to touch or drying greater than 8 and 18 hours, respectively, a second test shall be run on a different day and the average of the two tests taken.

(*d*) NATURE OF BAKED FILM.—Thoroughly clean with benzol a piece of bright sheet metal, either bright sheet iron, tin plate, or terneplate. Shake the sample of drier thoroughly and flow enough on the plate so that a space at least 7.5 cm (3 inches) wide is covered. Allow the plate to stand in a vertical position at room temperature for 30 minutes and then hang in an oven at a temperature of 100 to 105° C. (212 to 221° F.) for 2 hours.

Remove the plate from the oven and allow it to stand at room temperature for not less than 1 hour. Test the film of drier with a knife blade at a point not less than 2.5 cm (1 inch) from the edge. If the film powders or particles fly under the knife blade, it will be considered brittle, which will be cause for rejection.

(*e*) FLASH POINT.—Determine with either the "Tag" or Elliott closed-cup tester. The former is preferred.[1]

[1] Directions for using the Tag tester may be found in A. S. T. M. Standards D 56–21, and directions for using the Elliott cup in Proceedings A. S. T. M., 1917, pt. 1, p. 414.

4. BASIS OF PURCHASE.

Drier shall be purchased by volume, the unit being a gallon of 231 cubic inches at 15.5° C. (60° F.). The volume may be determined by measure or, in case of large deliveries, it may be easier to determine the net weight and specific gravity at 15.5/15.5° C. (60/60° F.) of the delivery. The weight per gallon in pounds can then be determined by multiplying the specific gravity by 8.33. The net weight in pounds divided by the weight per gallon gives the number of gallons.

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